Reviews and Bibliographical Notices.

On the Influence of the Structure of the Nerve Fibres upon the Production and Conduction of Nerve-Force. By H. D. Schmidt, of New Orleans, La.

Proceedings of the American Association for the Improvement of Science. Salem, 1882.

The well known histologist endeavors in this article to explain the structure of nerves in its relation to conduction. Hermann, who regards the liberated forces during nerve-action as chemical in their nature, gives the following summary of the more recent theories: "In every nervous particle a certain substance splits during its state of activity, and, in consequence of this splitting, the same takes place in the neighboring element; thereby some inhibitory force must be presumed, as the whole store of potential force present is not consumed at once."

The axis-cylinder, which Max Schultze thought to be composed of smooth fibrillæ, Schmidt regards as consisting of fibrillæ, representing rows of minute granules, united to one another by an intermediate substance—in other words, granular fibrillæ. When the axis-cylinder approaches its termination at the periphery, it divides successively into the individual fibrillæ, of which it was originally composed. All double bordered nerve fibres exhibit the segments of Ranvier, and the appearance of segmentation is due to the interruptions in the nerve-medulla, leaving the axis-cylinder, at the points of interruption, only covered by the external sheath. In examining the individual segments it will be found that they themselves are subdivided by a number of deep incisures, observed in the medullary sheath and passing obliquely from the inner surface of the external sheath to the axis-cylinder. These indentations were first observed by Stilling, and are known as the cylindro-conical segments of the medullary sheath. By treatment

with osmic-acid solution Schmidt became convinced that fine fibrillæ form a part of the structure of the medullary sheath, inasmuch as the cylindro-conical segments consist of a number of sub-segments, representing a system of loops. Each sub-segment resembles in form a hollow cone, or a funnel, placed with its narrow end or apex into the base or trumpet-like opening of the following segment, and receiving on the other side its preceding neighbor. While the margins of the bases of the fibrillar funnels are in contact with the inner surface of the external sheath, the margins of their narrow extremities embrace the axis-cylinder. The fibrillar loops of each individual funnel are not arranged in a parallel way, but slightly overlap each other, exhibiting an imbricated arrangement, and are imbedded in the semi-fluid part of the nerve-medulla.

Schmidt comes to the conclusion that the nervous current cannot be strictly compared with that of static or dynamic electricity; neither does this current solely depend for its production upon a particular central apparatus, but is, very probably, also generated in the conducting elements, the nerve fibres themselves. If the fibrillæ of the medullary sheath be arranged in the form of closed systems, the nerve-force, produced by the molecular changes accompanying the process of nutrition, might circulate through these systems in the form of circuits, increasing the main nervous current in strength by way of induction. C. HEITZMANN.

The Pathological Histology of the Spinal Cord. By S. G. WEBBER, M.D. Medical and Surgical Reports of the City Hospital of the City of Boston. Third series. Boston, 1882.

The author dwells first upon the normal histology of the spinal cord, giving credit to the observers, who have advanced our knowledge on this subject, being thoroughly based on the cell-doctrine. The great discrepancy of the views concerning the cells is most striking in the chapters entitled "Other Cells" and "Granular Corpuscles," both of pathological significance. In describing a pathological cavity, confined chiefly to the posterior columns, he says: "The walls were formed of fibres and cells. The fibres were broad and coarse, several times thicker than the normal neuroglia fibres. Near the cavity these fibres were interspersed with cells, forming a narrow and firm lining membrane; externally the fibres were more loosely woven together, with fewer cells and many granular corpuscles," etc. What is the difference, may we ask, between cells and granular corpuscles?